REMARKS/ARGUMENTS

Claims 17-24 stand in the present application, independent claim 17 having been amended. Reconsideration and favorable action is respectfully requested in view of the above amendments and the following remarks.

In the Office Action, the Examiner has rejected claims 17-24 under 35 U.S.C. § 103(a) as being unpatentable over Schetzina in view of Koide and Kern et al. Applicants respectfully traverse this rejection.

Applicants' invention is directed to a nitride semiconductor laser having an improved lifetime by, *inter alia*, forming a small-crack preventing layer made of $Al_aGa_{1-a}N$ ($0 < a < 0.1$) directly on the upper surface of the GaN substrate, i.e., directly on the laterally-grown single crystal GaN layer of the GaN substrate. Thus, in Applicants' invention, a composition step is intentionally formed at the interface between the GaN layer and the AlGaN crack-preventing layer so as to generate compressive strain. Applicants have amended independent claim 17 in order to emphasize the composition step at the interface between these two layers. Thus, claim 17 now more clearly recites that the small-crack-venting layer has a larger Al contact than the GaN layer at the interface between these two layers.

In the Office Action, the Examiner states that "Schetzina discloses an $Al_{1-y}Ga_yN$ layer 122b formed directly on the upper surface of the GaN layer 124b." (See Office Action at page 3.) The Examiner's statement, however, is only partially correct. Actually, the $Al_{1-y}Ga_yN$ layer 122b in Schetzina has a graded composition from GaN ($y = 1$) at the interface with the GaN layer 124b to $Al_{1-x}Ga_xN$ ($y = x$) at the interface with the $Al_{1-x}Ga_xN$ cladding layer. This grading feature is clearly shown in Figure 4B and

described at column 11, lines 14-20 of the cited reference. Thus, as shown in Figure 4B at the interface between the cladding layer and the GaN layer the compositions of the two layers are essentially identical with no aluminum content.

The cited reference further unequivocally states that this gradual composition is an important feature of the Schetzina device in that a composition step is specifically excluded (see, column 11, lines 21-30). This is because the $Al_{1-y}Ga_yN$ layer 122b is provided for eliminating the conduction band offset between the AlGaN cladding layer and the GaN layer. Therefore, the Examiner incorrectly speculates that the $Al_{1-y}Ga_yN$ layer 122b in Schetzina can generate compressive strain, because in fact at the interface the two layers have virtually the identical composition and therefore do not have different coefficients of thermal expansion and, thus, would not generate any compressive strain.

As noted above, Applicants have amended claim 17 in order to emphasize this distinction over the cited reference although Applicants submit that the claim as previously presented already distinguishes over the cited reference. Accordingly, it is respectfully requested that this clarifying amendment over the cited Schetzina reference be entered and considered on the merits even though this is a final Office Action.

Accordingly, claim 17, as amended, is believed to more clearly patentably distinguish over Schetzina in that the cited reference does not teach or suggest forming an Al-composition step between its GaN layer and the $Al_yGa_{1-y}N$ continuously-graded layer. Indeed, Schetzina would have led those of ordinary skill in the art away from providing such a composition step layer in that it discourages forming a composition

step so as to eliminate an offset between the GaN layer and the $Al_xGa_{1-x}N$ cladding layer, as clearly described at column 11, lines 3-31 and shown in Figure 4B.

In addition, even if Koide is combined with Schetzina, "small cracks" still occur. The Examiner has stated that Koide teaches that the lateral-growth could alleviate crack formation. However, cracks that are alleviated by lateral-growth are dislocations which are formed by growing a lattice-mismatched layer. "Small cracks" as disclosed in the present application are formed by growing a lattice-matched layer and therefore, are clearly different from conventional dislocations. Such small cracks are eliminated in Applicants' invention by forming small crack preventing layers having a larger aluminum content then the GaN layer at the interface with the GaN layer and having a coefficient thermal expansion less than that of GaN. This effect, however, cannot be obtained or even predicted by the combination of Schetzina and Koide.

Accordingly, amended claim 17 is believed to patentably define over the cited references taken either singly or in combination.

Therefore, in view of the above amendments and remarks, it is respectfully requested that the application be reconsidered and that all of claims 17-24, now standing in the application, be allowed and that the application be passed to issue. If there are any other issues remaining which the Examiner believes could be resolved through either a supplemental response or an Examiner's amendment,

the Examiner is respectfully requested to contact the undersigned at the local telephone exchange indicated below.

Respectfully submitted,

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